WAM™Arm

Quick-Start Guide

This Quick-Start Guide steps you through initializing the WAM system and running a simple program (gravity compensation). Please refer to the WAM™Arm User's Manual for more detailed instructions on installation and setup.

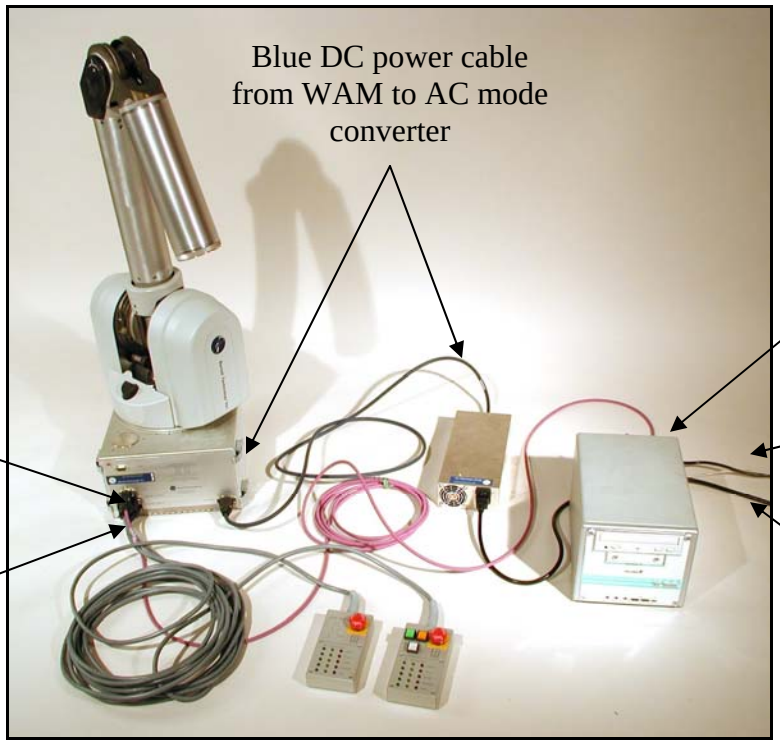
Lab Space Setup

Requirements for operation:

- Either 18-90 VDC or 60 Hz, 110 VAC (see System Setup in the User's Guide for power requirements)
- Flat surface to mount WAM using four M10 or 3/8" socket cap screws (see System Setup in User's Guide for hole placement)
- Monitor and keyboard (not supplied)

Assembly

After mounting the WAM to a suitable platform (detailed in User's Guide), arrange and connect the electrical cables as follows:


Blue DC power cable from WAM to AC mode converter
Monitor & keyboard connections (not shown)
AC line cord from AC mode converter to power
Purple data cable from WAM to PC
Two pendants
AC line cord from PC to power

© 2005 Barrett Technology®, Inc.

Starting the WAM™Arm

1) Launch control program (btdiag) on host
2) Turn on 48V supply, then press <Enter> (according to the on-screen directions)
    - Safety system comes online
    - Safety system loads defaults from flash/EEPROM
    - Safety system mode is set to JOINT velocity limiting
    - Safety system clears pendant
    - Safety system exercises pendant lights
    - Safety system recognizes critical bus undervoltage, critical fault
    - Safety system resistively brakes the WAM's power bus
3) Make sure both pendant E-STOP buttons are reset (up)
4) Press <Shift+Reset/Idle> on pendant to clear critical fault, then press <Enter>
    - Safety system recognizes "Idle/Reset" request
    - Safety system clears request
    - Safety system clears fault
    - Safety system releases the resistive braking
    - Safety system turns on the power bus
    - Motor controllers come online
    - Motor controllers wait in Monitor for "Initialize" command
    - There is no WAM braking at this stage
    - Safety system enumerates motor controllers
    - *** Safety system is fully operational now ***
    - Safety system registers heartbeat error, displays warning

```
login: root
password: WAM

      --- Linux ---
Hostname# cd btclient/src/btdiag
Hostname# ./run
```

5) Place the WAM into the home (folded) position, then press <Enter>
    - Host program defaults to IDLE (zero-torque) mode
    - Host program sends "Initialize" command to Motor controllers
    - Motor controllers load defaults from flash/EEPROM
    - Motor controllers apply FET braking at WAM motors
    - Host program sets the motor controller positions
    - Safety system mode is set to CARTESIAN velocity limiting
    - Host program sets the safety system velocity and torque limits
    - Host program requests positions from motor controllers
    - Motor controllers send positions to host program
    - Safety system records 125ms of position history
    - Safety system calculates/limits elbow & tip velocities
    - Host program sends zero-value torques to motor controllers
    - Safety system records latest torques
    - Safety system clears heartbeat error
    - *** Pendant should now display all OK ***
6) Press Shift-Activate on pendant
    - Safety system recognizes "activate" request
    - Safety system clears request
    - If there are no warning or faults, safety system sends "Activate" command to motor controllers
    - Motor controllers release their FET braking and apply received torques
    - *** Motor controllers are actively commutating zero torque now ***
7) Enable gravity-compensation (press 'g', enter '1.0' for a scaling factor)
    - Host program calculates and applies gravity compensation torques for the WAM

Congratulations! You've set up your WAM Arm!